© Entomological Society of Indochina
អ្នកជំនាញខាងជាណកសាស្ត្រឥណ្ឌូចិន
The Indochina Entomologist
OPEN ACCESS
New Record
ICE, 2 (33): 347–355 (2026)
ISSN (Online) 3065-1107
www.indochinaentomologist.com

https://doi.org/10.70590/ice.2026.02.33
http://zoobank.org/urn:lsid:zoobank.org:pub:4FF008D8-45D3-4E33-BC41-BEA17F55C4A0

Notes on *Eterusia raja* Moore, [1858] (Lepidoptera, Zygaenidae, Chalcosiinae) from China

Jian-Qiu KANG[1,3], Xin-Yao LU[1,2,4] & Ning ZHANG[1*]

[1]Shanghai Pudong Youth & Children's Center, Shanghai 200125, China

[2]Room 102, No. 14, Lane 1351, Nanmatou Road, Pudong New Area, Shanghai 200125, China

[3]https://orcid.org/0000-0001-7538-2902; jianqiukang@163.com

[4]https://orcid.org/0009-0002-3599-9347; olivialu2014@163.com

[*]Corresponding author. https://orcid.org/0009-0002-9569-7797; Zhangning915@163.com

Abstract: Living individuals of *Eterusia raja* Moore, [1858] are recorded for the first time in China (southern Xizang and northwestern Yunnan). An updated synthesis of its morphology, distribution, altitudinal range, flight period, and flower-visiting behavior on *Viburnum cylindricum* Buch.-Ham. ex D. Don is provided. In addition, its putative host plant is discussed, the nomenclatural date is emended, and Chinese common names of the *raja* group species are proposed.

Keywords: China, new record, taxonomy, Xizang, Yunnan, Zygaenidae

王柄脉锦斑蛾 *Eterusia raja* Moore, [1858]在中国的记述（鳞翅目，斑蛾科，锦斑蛾亚科）

康健秋 [1]，鲁昕瑶 [1,2] & 张宁 [1*]

[1] 上海市浦东新区青少年活动中心，上海 200125，中国

[2] 上海市浦东新区南码头路 1351 弄 14 号 102 室，上海 200125，中国

[*]通讯作者

摘要：本文首次在中国（西藏南部、云南西北部）记录到王柄脉锦斑蛾 *Eterusia raja* Moore, [1858] 的活体，完善了对该种形态、分布、海拔、飞行期及访花水红木 *Viburnum cylindricum* Buch.-Ham. ex D. Don 生态行为的认识。同时，讨论了其可能的寄主植物，更正了命名年份，并提出了 *raja* 种组物种的中文名。

关键词：中国，新纪录，分类学，西藏，云南，斑蛾科

Citation: Kang J-Q, Lu X-Y & Zhang N 2026: Notes on *Eterusia raja* Moore, [1858] (Lepidoptera, Zygaenidae, Chalcosiinae) from China. *The Indochina Entomologist*, 2 (33): 347–355. [康健秋，鲁昕瑶 & 张宁 2026: 王柄脉锦斑蛾 *Eterusia raja* Moore, [1858]在中国的记述（鳞翅目，斑蛾科，锦斑蛾亚科）. 中南半岛昆虫学家, 2 (33): 347–355.]
https://doi.org/10.70590/ice.2026.02.33

Accepted by Cheng-Bin WANG: 19.V.2026; published online: 5.VI.2026

Copyright Jian-Qiu KANG *et al*. This is an open access article distributed under the terms of the Creative Commons Attribution License (CCBY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Introduction

The genus *Eterusia* Hope, 1841 is a distinctive monophyletic group of chalcosiine moths (Lepidoptera: Zygaenidae: Chalcosiinae) distributed from the Indian subcontinent through mainland Southeast Asia to East Asia (Yen 2003a; Yen *et al.* 2005a, b). Adults are typically day-flying and well known for their complex sexual dimorphism, polymorphism and mimetic wing patterns, often exhibiting a spotted or banded forewing and a polychrome hindwing bearing a large central patch and several smaller spots of various shapes and colors (Yen 2003b; Huang *et al.* 2023).

The *raja* species-group was recently characterized by Huang *et al.* (2023) based on external morphology and genitalia characters. This group includes *E. raja* Moore, [1858] and *E. sinoraja* Huang & Horie, 2023. It is diagnosed by the metallic bluish dorsal abdomen, forewing with yellowish band or spots, hindwing with vivid orange pattern, and male genitalia characterized by a broad and trapezoidal modified 8th tergite, elongated posterior arms of the 8th sternite with dentations, and a strongly S-shaped aedeagus.

E. raja was regarded by Jordan (1908) as "one of the most beautiful species of the Zygaenids". It has previously been known from northeastern India and southern Xizang (Sondhi *et al.* 2021). During the Wild Fun Insect Enthusiasts Society ［野趣虫友会］ 2025 entomological expedition to Motuo, Xizang, living individuals of this species were collected for the first time in China. A new provincial record is also reported from northwestern Yunnan. Based on specimens and literature, the morphology, distribution, altitudinal range, flight period, and flower-visiting behavior of *E. raja* are summarized. In addition, its putative host plant is discussed, the nomenclatural date is emended, and the Chinese common names of *E. raja* group species are formally proposed.

Material and methods

Specimens examined are deposited in the following institutional and private collections: Shanghai Pudong Youth & Children's Center (SPYCC), Shanghai, China; the private collection of Zhuo-heng Jiang (CJZH), Kunming, China; the private collections of Shuai Zhao (CZS), Tianjin, China. Abdomen was removed and macerated in hot 10% KOH solution for examination of male genitalia, and the extracted structures were stored in a microvial filled with pure glycerol.

Adult habitus photographs were taken with an OM System OM-1 Mark II camera fitted with an OM System M.Zuiko Digital ED 90mm F3.5 Macro IS PRO lens. Genitalia photographs were taken with the same camera and lens combination, extended with an OM System M.Zuiko Digital 2x teleconverter MC-20. All images above were captured as focal series and focus-stacked using Helicon Focus 8.3. Flower-visiting photograph was taken with a Canon EOS R7 camera fitted with a Canon RF 100–400 mm F5.6–8 IS USM lens. The distribution map was generated using Google Earth Pro. Final image processing and plate assembly were completed in Adobe Photoshop 2026.Terminology of adult and genitalia morphology follows Klots (1970) and Yen *et al.* (2005a).

Taxonomy

Genus *Eterusia* Hope, 1841

Eterusia Hope, 1841, *Trans. Linn. Soc.* 18: 445.

Type species: *Eterusia tricolor* Hope, 1841.

The *Eterusia raja* species-group

Eterusia sinoraja Huang & Horie, 2023 华王柄脉锦斑蛾

Figs 4–5

Eterusia sinoraja Huang *et al.*, 2023, *Zootaxa* 5270 (1): 125, figs 1–3, 10, 13, 16, 18.

Type locality: Yingjing County, Ya'an City, Sichuan Province, China.

Material examined: 1♂ (CJZH), CHINA: Sichuan Province, Ya'an City, Yingjing County, Anjing Township, Yinchanggou Mine [银厂沟矿山]; alt. 1900 m, VIII.2025, leg. local collector; 1♀ (CZS), same collecting locality, VIII.2024, leg. local collector.

Distribution. China (Sichuan).

Eterusia raja Moore, [1858] 王柄脉锦斑蛾

Figs 1–3, 6–10

Eterusia raja Moore, [1858], *in* Horsfield & Moore, *A catalogue of the lepidopterous insects in the Museum of Natural History at the East-India House* 2: 320, pl. 8a, fig. 2; Walker,1864: 117; Kirby, 1892: 49; Fletcher, 1925: 5; Endo & Kishida, 1999: 99; Yen *et al.*, 2005a: 294, 2005b: 361; Sondhi *et al.*, 2021: 4, image 10; Huang *et al.*, 2023: 129.

Eterusia rajah Jordan, 1908, *in* Seitz A (Ed), *Die Gross-Schmetterlinge der Erde* 10: 33, pl. 6, line d.

Heterusia raja Hampson, 1892, *The Fauna of British India (Moths)* 1: 259; Dudgeon, 1899: 298.

Heterusia rajah Hering, 1922, *Archiv f. Naturg.* 88 A (11): 63.

Type locality: Darjeeling, West Bengal State, India.

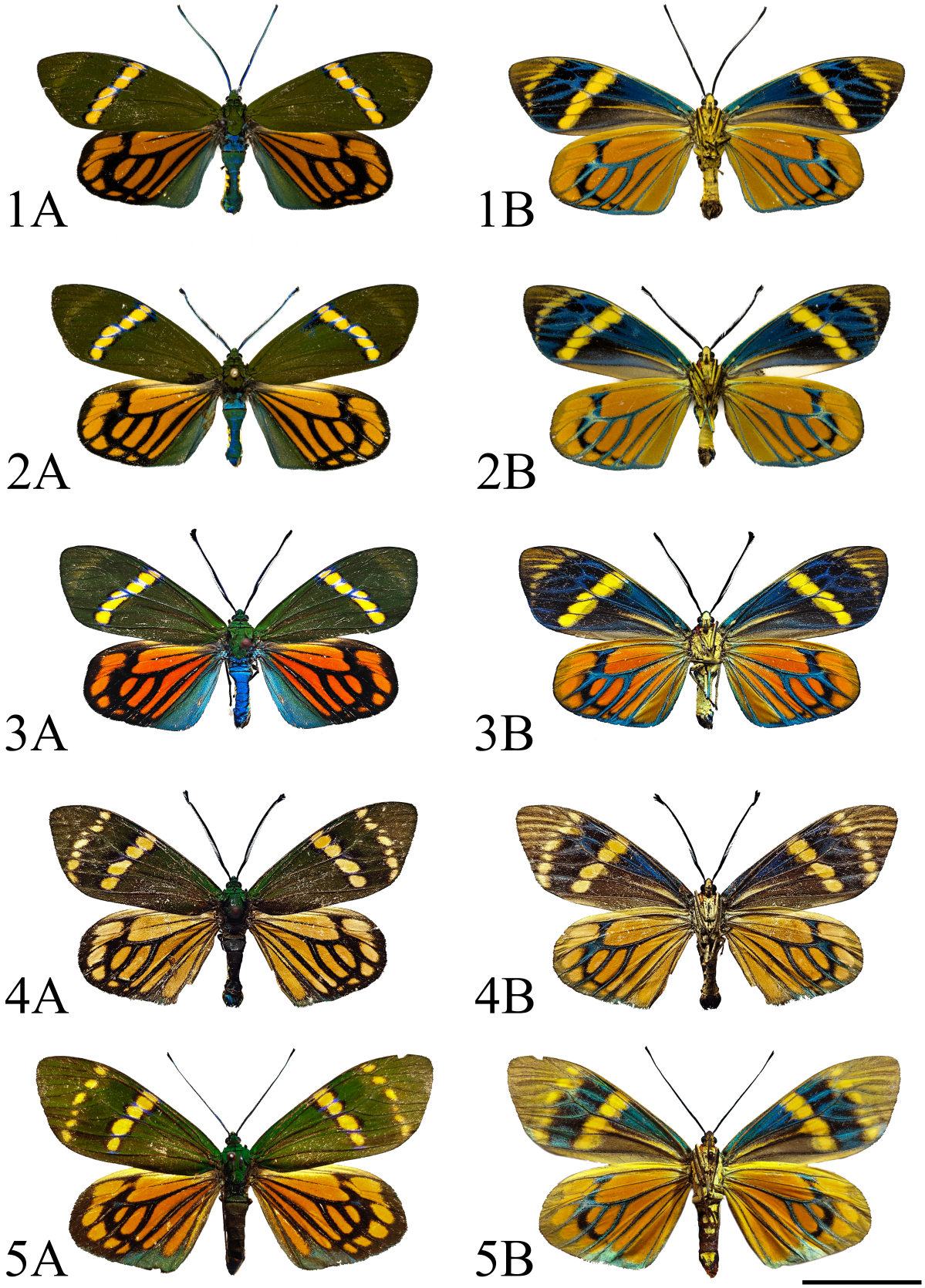
Material examined: 1♂, (SPYCC), CHINA: Xizang Autonomous Region, Linzhi City, Motuo County, Gelin Village, Piaomiao Tea Garden [缥缈茶园]; 29°12′25″N, 95°10′32″E; alt. 1759 m, 20.VIII.2025, leg. Xin-yao Lu, SPYCC003; 1♂, (SPYCC), same collecting locality and date, leg. Jin Zhai, SPYCC004; 1♀, (CJZH), same collecting locality and date, leg. Jin Zhai; 1♂, (CJZH), CHINA: Yunnan Province, Fugong County, Shiyueliang [石月亮]; alt. 1830 m, 21.VII.2025, leg. Xin Wang.

Diagnosis (Figs 1–3, 8–9)**.** Head—Antenna metallic blue, bipectinate with black rami. Vertex metallic green. Frontoclypeus prominent. Thorax—Dorsally metallic green. Ventrally yellow. Collar narrowly crimson. Forewing—Elongated and narrow. Ground color metallic deep green. A transverse band composed of 6 yellow spots extends from middle of costa to tornus, the band edged with black on both sides and the veins within it blue. A narrow, diffuse pale green band presents beyond the discal cell. Cilia black. Hindwing—Ground color orange, with veins broadly bordered black. A curved black submarginal band extending from upper angle of discal cell to outer margin at vein Cu2. Outer margin black. Abdominal margin broadly blue-green. Cilia black. Abdomen—Dorsally metallic green. Ventrally yellow. 8th tergite medially trapezoid, with a pair of apodeme anteriorly and posteriorly. 8th sternite comprises a dumbbell-like anterior section and a pair of blade-like posterior arms bearing dentation along the inner side. Medial section of anterior sclerite 1/4 the width of remainder.

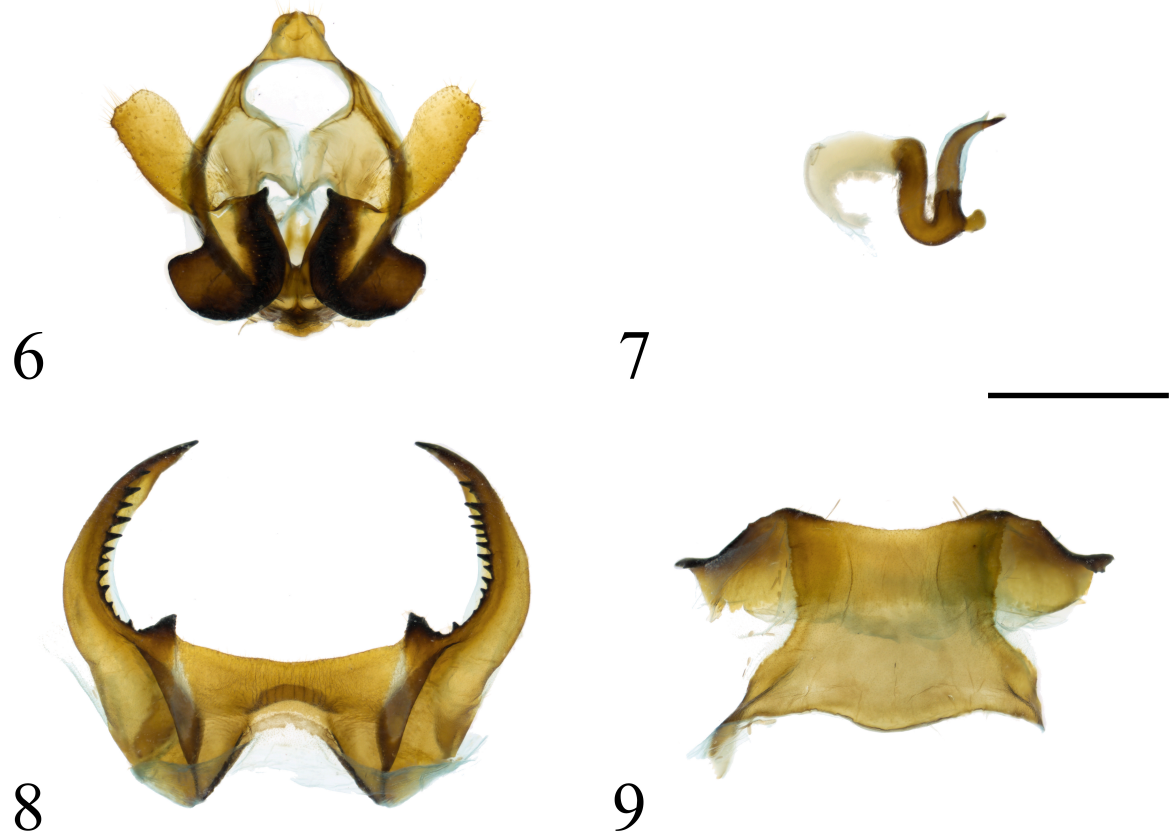
Male genitalia (Figs 6–7)—Uncus-tegumen complex comprising rounded lateral lobes and a triangular medial section; tegumenal arms slender, fused with vinculum; anterior tegumenal apodeme moderately sclerotized, broad at base and abruptly narrowed distally, then bent downwards. Valva moderately sclerotized; cucullus nearly uniform in width; distal end of inner projection of Sacculus narrower and rounded. Saccus rounded. Aedeagus strongly S-shaped, medio-ventrally narrowed and with a protuberance, apex tapering.

Distribution. China (Yunnan, Xizang), India (Assam, Nagaland, West Bengal).

Bionomics. Adults fly from June to September, at altitudes between approximately 1500 and 1830 m. In Motuo, over 20 individuals were observed flying actively and visiting flowers of *Viburnum cylindricum* Buch.-Ham. ex D. Don (Adoxaceae) between 13:30 and 14:00 local time, at an approximate height of 5–6 m in the canopy (Fig. 10).



FIGURES 1–5. Adults of *Eterusia raja* species-group: **1** *E. raja*, male, Xizang, China, SPYCC003 (SPYCC) **2** *ditto*, male, Xizang, China, SPYCC004 (SPYCC) **3** *ditto*, female, Xizang, China (CJZH) **4** *E. sinoraja*, male, Sichuan, China (CJZH) **5** *ditto*, female, Sichuan, China (CZS). **A** = upperside **B** = underside. Scale bar = 2.0 cm. Photo: Chen-yu Gu (1–2); Zhuo-heng Jiang (3–5).



FIGURES 6–9. Male terminalia of *E. raja* (Xizang, China, SYPCC003): **6** genital capsule **7** aedeagus **8** Sternite **9** tergite. Scale bar = 2.0 mm. Photo: Jian-qiu Kang.

Remarks. *E. raja* is externally similar to *E. sinoraja*, but can be distinguished by the following characters: 1) the forewing bears a compact transverse band composed of yellowish spots in the medial area, whereas *E. sinoraja* has two loose rows that occupy both the medial and postmedial areas; 2) the hindwing is broadly blue-green at vannal region, whereas in *E. sinoraja* only the veins and outer margin at the anal angle are blue-green, the remainder being orange with black veins; 3) in male genitalia, the distal end of the inner projection of the sacculus is narrower and rounded, in contrast to the broader and flat distal end in *E. sinoraja*; the cucullus is nearly uniform in width along its entire length, while in *E. sinoraja* it is basally narrowed and gradually expanded distally; the aedeagus is medio-ventrally narrower near the protuberance, and the protuberance is longer; the medial section of the anterior sclerite of the 8th sternite is narrower; 4) in female genitalia, the antrum is smaller and the ostium bursae is slightly narrower (Huang *et al.* 2023).

Discussion

Nomenclatural year. The publication date of *E. raja* has long been cited as 1859. Examination of the original volume shows that cover bears the imprint date "1858–9", but the part in which Moore described the species was actually issued on 30 June 1858, as recorded at the foot of page 334. In accordance with the Article 21.6 of *International Code of Zoological Nomenclature* (ICZN, 1999), the earliest demonstrable date of issue takes precedence for nomenclatural purposes. Therefore, the nomenclatural authorship of *E. raja* is cited herein as Moore, [1858], rather than Moore, 1859.

FIGURE 10. Adults of *E. raja* visiting flowers of *V. cylindricum* at Piaomiao Tea Garden, Gelin Village, Motuo County, Linzhi City, Xizang, China, 1759 m, 20.VIII.2025. Photo: Xin-yao Lu.

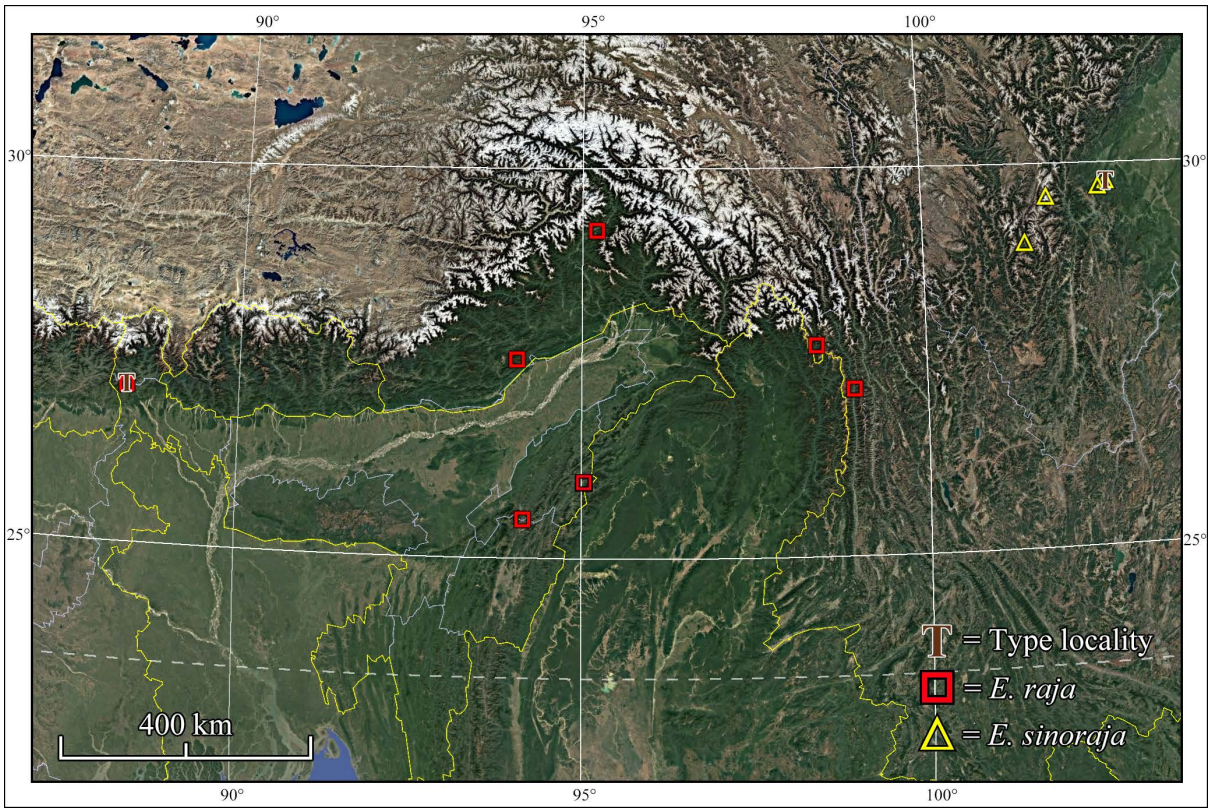


FIGURE 11. Distribution of the *Eterusia raja* species-group: *E. raja* (red square) and *E. sinoraja* (yellow triangle).

Distribution. *E. raja* was previously considered endemic to northeastern India and southern Xizang. Historical records attributed to Sikkim (Hampson 1887; Kirby 1892) lack precise localities, and the "Tukvar, Sikkim" record of Dudgeon (1899) is in fact referable to the Tukvar Valley in the Darjeeling District, West Bengal, rather than the present-day state of Sikkim. Other verified Indian records are from the Naga Hills, Assam (Jordan 1908; Huang *et al.* 2023) and Khuzama, Kohima District, Nagaland (Sondhi *et al.* 2026). In China, the species is formally recorded for the first time based on living individuals from Motuo, Xizang and Fugong, Yunnan. Prior to this, the only record from China was a hindwing of a dead individual reported by Sondhi *et al.* (2021) from southern Xizang (Cuona City, Xizang). An insect enthusiast also mentioned through personal communication the occurrence of *E. raja* from the Dulongjiang Township, Gongshan Dulong and Nu Autonomous County, Nujiang Lisu Autonomous Prefecture, Yunnan Province, near the Myanmar border, with the earliest records of adults flying from June to July, further extending its known range eastward. Taken together, these records indicate that *E. raja* is distributed along the southern slopes of the eastern Himalayas, extending from northeastern India into southwestern China, and probably also into Bhutan and northern Myanmar.

Biology. *V. cylindricum* is documented here for the first time as a nectar source for *E. raja*. This evergreen tree is common in montane forests of the eastern Himalayas and southern China, flowering from June to October (Hsu, 1988), which coincides well with the records of *E. raja*. The host plant and immature stages of *E. raja* remain unknown. Notably, the Chinese collecting site and the type locality are both surrounded by extensive tea plantations. Since several congeneric species are known to feed on the leaves of *Camellia sinensis* (L.) Kuntze (Theaceae), e.g. *E. aedea* (Linnaeus, 1763) and *E. risa* (Doubleday, 1844) (Mitra *et al.* 2018), it is plausible that *E. raja* also feeds on tea plants. Field surveys are required to clarify its exact host range.

Chinese common names. The generic Chinese name "柄脉锦斑蛾" combines "锦斑蛾", the standard vernacular for chalcosiine moths, with "柄脉" (petiole and veins), referring to the characteristic larval feeding damage that reduces leaves to petioles and main veins. The specific epithet *raja*, from the Sanskrit *rājan* (राजन्, "king"), alludes to the species' majestic appearance and is rendered as "王" in the Chinese name. The name *sinoraja* combines the Latin prefix *sino-* (Chinese) with *raja*, indicating a Chinese ally of *E. raja*. "华" corresponds to *sino-* and "王" to *raja*. Accordingly, the Chinese common names "王柄脉锦斑蛾" (*E. raja*) and "华王柄脉锦斑蛾" (*E. sinoraja*) are formally proposed here.

Acknowledgements

We are grateful to Zhuo-heng Jiang [蒋卓衡] (Yunnan University, Yunnan, China) for providing specimens and photographic materials, and for his helpful comments to the manuscript; Jin Zhai [翟劲] (Shanghai Datong High School, Shanghai, China) and Xin Wang [王鑫] (Yunnan, China) for collecting specimens; Shuai Zhao [赵帅] (Tianjin, China) for providing additional specimens; Zhen Zhang [张振] (Shanghai Chenshan Botanical Garden, Shanghai, China) for identifying host plants; and Chen-yu Gu [顾宸宇] (Shanghai Fushan Foreign Language Primary School, Shanghai, China) for specimen photography.

References

Dudgeon GC 1899: A catalogue of the Heterocera of Sikhim and Bhutan. Part V. *The Journal of the Bombay Natural History Society*, 12: 292–303.

Endo T & Kishida Y 1999: *Day-flying Moths: Chalcosiinae, Epicopeia*. *Endless Collection Series, Vol. 8*. Endless Science Information, Tokyo, 119 pp, 88 pls.

Fletcher TB 1925: *Catalogue of Indian Insects, Part 9–Zygaenidae*. Government of India Central Publication Branch, Calcutta, 92 pp.

Hampson GF 1892: *The Fauna of British India, Including Ceylon and Burma. Moths, Vol. 1*. Taylor and Francis, London, xxiii + 527 pp.

Hering M 1922: Revision der orientalischen Chalcosiinen. *Archiv für Naturgeschichte*, 88A (11): 1–93.

Hope FW 1841: Descriptions of some new Insects, collected in Assam by William Griffith, Esq., Assistant-Surgeon in the Madras Medical Service, and attached to the late Scientific Mission to Assam. *Transactions of the Linnean Society*, 18: 435–447, pls. 30–31.
https://doi.org/10.1111/j.1095-8339.1838.tb00192.x

Hsu P-S 1988: *Viburnum* Linn. *In*: Hsu P-S (Ed) *Flora Reipublicae Popularis Sinicae, Vol. 72*. Science Press, Beijing, pp. 12–104, pls. 3–23. [徐柄声 1988: 荚蒾属. 见: 徐柄声 (主编) 中国植物志, 第 72 卷. 科学出版社, 北京, pp. 12–104, pls. 3–23.]

Huang S-Y, Zhang Y-L, Horie K & Espeland M 2023: A new species of the genus *Eterusi*a Hope from western China (Lepidoptera, Zygaenidae, Chalcosiinae). *Zootaxa*, 5270 (1): 124–132.
https://doi.org/10.11646/zootaxa.5270.1.7

ICZN 1999: *International Code of Zoological Nomenclature (4th Edition)*. International Trust for Zoological Nomenclature, London, xxix + 306 pp.

Jordan K 1908: Zygaenidae. *In*: Seitz A (Ed) *Die Gross-Schmetterlinge der Erde*, Vol. 10. Fritz Lehmann Verlag, Stuttgart, pp. 5–56, pls. 1–8.

Kirby WF 1892: *A Synonymic Catalogue of Lepidoptera Heterocera (Moths). Vol. 1: Sphinges and Bombyces*. Gurney & Jackson, London, xii + 951 pp.

Klots AB 1970: Lepidoptera. *In*: Tuxen SL (Ed) *Taxonomist's Glossary of Genitalia in Insects (2nd Revised and Enlarged Edition)*. Munksgaard, Copenhagen, pp. 115–130.

Mitra B, Shah SK & Mishra P 2018: Insect fauna associated with the tea ecosystem of North Bengal, India. *Records of the zoological Survey of India*, 118 (2): 178–193.
https://doi.org/10.26515/rzsi/v118/i2/2018/120289

Moore F 1858: Tribe III. Bombyces. Stirps I. Larvae Sphingiformes. *In*: Horsfield T & Moore F (Eds) *A Catalogue of the Lepidopterous Insects in the Museum of Natural History at the East-India House, Vol. 2*. WM. H. Allen and Co., London, pp. 279–334, pls. 7A–8A + 13–14.

Sondhi S, Karmakar T, Sondhi Y & Kunte K 2021: Moths of Tale Wildlife Sanctuary, Arunachal Pradesh, India with seventeen additions to the moth fauna of India (Lepidoptera: Heterocera). *Tropical Lepidoptera Research*, 31 (Suppl. 2): 1–53.

Sondhi S, Singh RP, Iyer G, D'silva J & Kunte K (Eds) 2026: *Moths of India, v. 4.2.* Indian Foundation for Butterflies Trust. Available from: https://www.mothsofindia.org (accessed 3.V.2026).

Walker F 1864: *List of the Specimens of Lepidopterous Insects in the Collection of the British Museum, Part XXXI*. Order of the Trustees, London, 321 pp.

Yen S-H 2003a: Phylogeny and systematics of the major lineages of Chalcosiinae s.l. (Zygaenidae s.l.): Preliminary observations on morphological characters *In*: Efetov KA, Tremewan WG & Tarman GM (Eds), *Proceedings of the 7th International Symposium on Zygaenidae, Innsbruck, 4–8 September 2000*. Crimean State Medical University Press, Simferopol, pp. 293–359.

Yen S-H 2003b: A new species of *Eterusia* Hope, 1841 (Lepidoptera: Zygaenidae, Chalcosiinae) from Mindanao and Seram. *Entomologische Zeitschrift*, 113 (4): 121–126.

Yen S-H, Robinson GS & Quicke DLJ 2005a: The phylogenetic relationships of Chalcosiinae (Lepidoptera, Zygaenoidea, Zygaenidae). *Zoological Journal of the Linnean Society*, 143: 161–341.
https://doi.org/10.1111/j.1096-3642.2005.00139.x

Yen S-H, Robinson GS & Quicke DLJ 2005b: Phylogeny, systematics and evolution of mimetic wing patterns of *Eterusia* moths (Lepidoptera, Zygaenidae, Chalcosiinae). *Systematic Entomology*, 30: 358–397.
https://doi.org/10.1111/j.1365-3113.2004.00284.x

Additional information

Author contributions: Conceptualization: J-Q Kang. Resources: N Zhang & X-Y Lu. Visualization: J-Q Kang. Writing-original draft: J-Q Kang. Writing-review and editing: J-Q Kang & N Zhang.

Conflict of interest: The authors have declared that no competing interests exist.

Data availability: All of the data that support the findings of this study are available in the main text.

Ethical statement: No ethical statement was reported.

Funding: This study was self-funded by the authors.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of *ICE* and/or the editor(s). *ICE* and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.

Photo Gallery

栀子花多翼蛾 *Alucita flavofascia* (Inoue, 1958)
Sunqiao, Pudong New Area, Shanghai
photograph by Ning ZHANG [张宁]